

What is claimed is:

- 1 1. A multiple-domain processing system, comprising:
2 a first processing domain having a first host processor and at least one first end
3 node;
4 a second processing domain having a second host processor and at least one
5 second end node; and
6 a multi-dimensional switching fabric coupled to said first processing domain
7 and said second processing domain to provide peer-to-peer packet communication
8 within said processing system on multiple orthogonal planes, a first plane providing
9 intra-domain packet communication and a second plane providing inter-domain packet
10 communication.
- 1 2. The multiple-domain processing system of claim 1, wherein:
2 said first host processor includes a tightly-coupled processor complex.
- 1 3. The multiple-domain processing system of claim 2, wherein:
2 said first and second processing domains are loosely-coupled.
- 1 4. The multiple-domain processing system of claim 1, wherein:
2 said multi-dimensional switching fabric includes at least one local switch
3 associated with said first processing domain, at least one local switch associated with
4 said second processing domain, and at least one global switch to provide packet
5 communication between said first and second processing domains.
- 1 5. The multiple-domain processing system of claim 4, wherein:
2 said at least one local switch associated with said first processing domain
3 includes local packet routing information and global packet routing information.

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1 6. The multiple-domain processing system of claim 5, wherein:
2 said local packet routing information includes a local lookup table and said
3 global packet routing information includes a global lookup table.

1 7. The multiple-domain processing system of claim 5, wherein:
2 said local packet routing information includes memory map information and
3 said global packet routing information includes a global lookup table.

1 8. The multiple-domain processing system of claim 5, wherein:
2 said at least one local switch associated with said first processing domain
3 selects, based on information within a received packet, either the local packet routing
4 information or the global packet routing information for use in routing the received
5 packet.

1 9. The multiple-domain processing system of claim 8, wherein:
2 said information within said received packet includes a local/global flag.

1 10. The multiple-domain processing system of claim 8, wherein:
2 said information within said received packet includes packet destination
3 information.

1 11. The multiple-domain processing system of claim 4, wherein:
2 said at least one global switch includes global packet routing information for
3 use in routing a received packet based on destination domain information within the
4 received packet.

1 12. The multiple-domain processing system of claim 1, wherein:
2 said first host processor includes a packet generator to generate a packet for
3 delivery to a destination node that includes information identifying a domain of the
4 destination node.

1 13. The multiple-domain processing system of claim 1, wherein:
2 said first host processor includes a packet generator to generate a packet for
3 delivery to a destination node that includes information identifying a plane within the
4 multi-dimensional switching fabric in which the packet is to be routed.

1 14. A multiple-domain processing system, comprising:
2 a first processing domain having a first host processor, at least one first local
3 switch, and at least one first end node, said at least one first local switch to provide
4 packet communication between said first host processor and said at least one first end
5 node;
6 a second processing domain having a second host processor, at least one second
7 local switch, and at least one second end node, said at least one second local switch to
8 provide packet communication between said second host processor and said at least one
9 second end node; and
10 at least one global switch to provide packet communication between a first local
11 switch in said first processing domain and a second local switch in said second
12 processing domain.

1 15. The multiple-domain processing system of claim 14, wherein:
2 said at least one first local switch includes local routing information and global
3 routing information.

1 16. The multiple-domain processing system of claim 15, wherein:
2 said at least one first local switch selects, based on information within a
3 received packet, either the local routing information or the global routing information
4 for use in routing the received packet.

1 17. The multiple-domain processing system of claim 15, wherein:
2 said local routing information includes memory map information for said first
3 processing domain.

1 18. The multiple-domain processing system of claim 14, wherein:
2 said at least one global switch includes a filter to block a received packet that is
3 identified as a local packet.

1 19. The multiple-domain processing system of claim 14, wherein:
2 said at least one global switch includes a toggle unit to change a local/global
3 flag within a received packet from global to local.

1 20. The multiple-domain processing system of claim 14, wherein:
2 said at least one global switch includes global packet routing information for
3 use in routing a received packet based on destination domain information within the
4 received packet.

1 21. The multiple-domain processing system of claim 14, wherein:
2 said first processing domain and said second processing domain utilize different
3 operating systems.

1 22. The multiple-domain processing system of claim 14, wherein:
2 said first processing domain and said second processing domain utilize different
3 switching fabric technologies.

1 23. A switch for use in a multi-dimensional switching fabric in a multiple-domain
2 processing system, comprising:
3 first memory space to store first packet routing information for routing
4 operations within a first orthogonal plane;

1 28. The switch of claim 27, wherein:
 2 the second packet routing information includes information for use in routing
 3 packets that are to travel between a first multiple-domain processing system and a
 4 second multiple-domain processing system.

1 29. The switch of claim 23, wherein:
 2 the first packet routing information is to be stored as a first lookup table and the
 3 second packet routing information is to be stored as a second lookup table.

1 30. The switch of claim 23, wherein:
 2 said selection unit selects either the first packet routing information or the
 3 second packet routing information based on a flag within the received packet.

1 31. A method for configuring a multiple-domain processing system having a multi-
 2 dimensional switching fabric, comprising:
 3 discovering end nodes within each of a plurality of processing domains in the
 4 multiple-domain processing system and assembling information relating thereto;
 5 identifying a system manager node within the multiple-domain processing
 6 system; and
 7 discovering domains in the multiple-domain processing system, from the system
 8 manager node, and assembling information relating to said discovered domains, said
 9 information relating to said discovered domains including information assembled while
 10 discovering end nodes.

1 32. The method of claim 31, wherein:
 2 discovering end nodes includes transmitting local configuration packets within
 3 each of said plurality of processing domains.

1 33. The method of claim 32, wherein:
 2 said plurality of processing domains includes a first processing domain and a
 3 second processing domain, wherein said method further comprises blocking local
 4 configuration packets transmitted within the first processing domain from being
 5 delivered to the second processing domain.

1 34. The method of claim 31, wherein:
 2 said plurality of processing domains each include a host processor, wherein
 3 discovering end nodes includes discovering end nodes from a corresponding host
 4 processor within each of said plurality of processing domains.

1 35. The method of claim 34, wherein:
 2 identifying a system manager node within the multiple-domain processing
 3 system includes identifying a host processor within one of said plurality of processing
 4 domains.

1 36. The method of claim 31, wherein:
 2 discovering domains in the multiple-domain processing system includes
 3 transmitting global configuration packets from the system manager node to other
 4 domains through the multi-dimensional switching fabric.

1 37. The method of claim 36, wherein:
 2 discovering domains in the multiple-domain processing system includes
 3 receiving information from other domains, in response to said global configuration
 4 packets, that relates to available processing nodes within the other domains.

1 38. The method of claim 31, further comprising:
 2 generating local routing information for use within a local switch associated
 3 with a first processing domain using information assembled while discovering end
 4 nodes within said first processing domain.

1 39. The method of claim 38, further comprising:
2 generating global routing information for use within said local switch associated
3 with said first processing domain using information assembled while discovering
4 domains in the multiple-domain processing system.

1 40. The method of claim 31, further comprising:
2 generating global routing information for use within a global switch within the
3 multi-dimensional switching fabric using information assembled while discovering
4 domains in the multiple-domain processing system.

1 41. The method of claim 31, wherein:
2 discovering end nodes within a first processing domain includes generating a
3 memory map identifying resources within said first processing domain.